



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/790,188

03/02/2004

Katsunori Suzuki

118655

2943

25944

7590

05/03/2006

OLIFF & BERRIDGE, PLC  
P.O. BOX 19928  
ALEXANDRIA, VA 22320

EXAMINER

MACARTHUR, SYLVIA

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/790,188	<b>Applicant(s)</b> SUZUKI ET AL.	
	<b>Examiner</b> Sylvia R. MacArthur	<b>Art Unit</b> 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 10-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 March 2002 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/17/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of claims 1-9 in the reply filed on 2/24/2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant claims a "plate- shaped quartz component" in claim 1, but further claims that this "component" comprises an inner perimeter, etc. This language makes the claim indefinite and may be best claimed as a "quartz ring".

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

Art Unit: 1763

international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Rossman et al (US 5,748,434).

Re claims 1-3: Rossman et al teaches a plate-shaped quartz component (shield 5 is the combination of first and second shield members (60 and 62) see Fig. 3, an electrode (pedestal 14).

Re claims 6-8: Rossman et al further teaches a processing chamber 8, a electrode, and a plate shaped quartz component (shield 5 is the combination of first and second shield members (60 and 62).

6. Claims 1-3 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Schneider et al (US 6,364,957).

Re claims 1-3: Schneider et al teaches a plate-shaped quartz component (upper outer ring 350), see Fig. 1A, an electrode (343).

Re claims 6-8: Schneider et al further teaches a processing chamber 330, a electrode 343, and a plate shaped quartz component (upper outer ring 350).

7. Claims 1-3 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Dhinsa et al (US 6,391,787).

Re claims 1-3: Dhinsa et al teaches a plate-shaped quartz component (step 11), see Fig. 1A/1B, an electrode (10).

Re claims 6-8: Dhinsa et al further teaches a processing chamber 330, a electrode 10, and a plate shaped quartz component (step 11).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rosmann et al or Scheider et al or Dhinsa et al, henceforth known as the primary prior art.

The teachings of the primary prior art was discussed above.

All fail to teach the specific dimensions for the heights of the first and second regions.

All the prior art teach the motivation for provide a difference in height between the first and second regions with the first region being higher than the second is to protect the electrode from damage from the plasma.

The specific height is a matter of optimization which is held to have been obvious over In re Boesch that it is well within skill of in the art to determine the optimum values of cause effect variables. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to optimize the heights of the first and second regions and their subsequent difference in height to ensure optimal protection of the electrode.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the primary prior art in view of Ma et al (US 2002/0139478).

The prior art by Ma et al teaches a shield or ring surrounding a workpiece in a plasma chamber. Fig. 4 of Ma et al illustrates a beveled inner perimeter. In section [0038] Ma et al teaches that the spatial contour or bevel along the inner perimeter is an optimal shape

Art Unit: 1763

whose motivation is to minimize the difference between process performance near the perimeter of the workpiece and the center of the workpiece.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to bevel the contour along the inner perimeter of the quartz components to provide an optimized flow of plasma toward the substrate away from the electrode which are easily damaged.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rossmann et al or Scheider et al, in view of Dhinsa et al.

The teachings of the prior art by Rossmann or Scheider et al were discussed above.

Both fail to teach an upper electrode with a plasma resistant ring.

The teachings of Dhinsa et al were discussed.

The motivation to modify the apparatus of Rossmann et al or Scheider et al with the upper electrode of Dhinsa et al is the provision of an upper electrode allows for plasma formation due to parallel plate electrodes and the provision for step 11 which controls the localized density of plasma formed by the electrode, see col.5 lines 1-5.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide a stepped showerhead electrode as a modification of the apparatus of Rossmann et al or Scheider et al.

### ***Conclusion***


12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438.

The examiner can normally be reached on M-F during the hours of 8:30 a.m. and 5 p.m..

Art Unit: 1763

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Sylvia R. MacArthur  
Patent Examiner  
Art Unit 1763

May 1, 2006